

Bevel gear mechanism, in particular hypoid bevel gear mechanism

The invention relates to a bevel gear mechanism, in particular hypoid bevel gear mechanism with an output shaft which is mounted in a housing and which is assigned a bevel gear which interacts with a drive bevel gear.

Such bevel gear mechanisms, in particular hypoid bevel gear mechanisms, are commercially available and known and customary in a variety of forms and embodiments. They are used, in particular, for deflecting torque by, for example, 90°, and the intention is that other ranges of deflection will also lie within the scope of the present invention.

A disadvantage with conventional gear mechanisms is that they have to be redesigned and reconfigured for different customer-specific requirements in each case. In particular, customer-specific requirements are, for example, different drive sleeves, drive shafts, different transmission ratios, different receptacle for output elements or the like.

Owing to the customer-specific variety, conventional hypoid bevel gear mechanisms are manufactured in a very wide variety of variants. This is very expensive and costly in terms of fabrication technology.

DE 199 57 743 A discloses an angular gear mechanism in which a bevel gear is seated a drive shaft, said bevel gear driving a hollow shaft which is arranged perpendicularly thereto.

DE 24 03 504 A discloses a bevel gear mechanism in which two shafts are arranged perpendicularly with respect to one another in a common plane and the shafts each have bevel gears which engage one in the other.

US 5,816,116 describes a hypoid bevel gear mechanism from which special flange arrangements for suspending the angular gear mechanism are provided.

The publication from the periodical Machine Design of 23.07.1993, Vol. 65, No. 15, page 38, ISSN: 00249114 discloses an angular gear mechanism, a shaft which is supported in a flange and on which a bevel gear is seated being provided within the angular gear mechanism. Said bevel gear intermeshes with a bevel gear of an output shaft.

The present invention is based on the object of providing a bevel gear mechanism, in particular a hypoid bevel gear mechanism, which eliminates the aforesaid disadvantages and with which it is possible to use standard components which can be used very cost-effectively and easily to construct a bevel gear mechanism to which, for example, any desired output elements or drive elements can be connected in a modular fashion on a customer-specific basis. The intention of this is to reduce fabrication costs while at the same time increasing the flexibility of the bevel gear mechanism.

This object is achieved by means of the features of patent claim 1 and the features of the coordinate claims 2

and 3.

In the present invention it is particularly advantageous to connect a single stage or multistage gear mechanism or a drive shaft which is dimensioned in any desired way to the hypoid stage in a modular fashion by means of a flange. Corresponding customer-specific dimensioning of the drive shaft, for example in terms of diameter, length etc., preferably accommodated in an assembly, can thus be taken into account without the hypoid stage having to be changed. All that is necessary to do this is for the assembly which contains the drive shaft to be customized so that the rest of the bevel gear mechanism can be inserted and used for different drive shafts or assemblies.

In this context, the assembly containing the drive shaft can be replaced very quickly and easily with the bevel gear mechanism or by a single stage or multistage gear mechanism.

respect to the stop 6.

In this way, very simple mounting with an extremely short overall length L is obtained so that by means of the main bearings 2.1, 2.2 the output shaft 3 is clamped in axially inside the housing 1 and is mounted in a radially rotatable fashion. Combining the main bearing 2.1 on the bevel gear 7 forms a bevel gear mechanism which withstands high stresses and at the same time permits main bearings 2.1 and 2.2 which are dimensioned so as to be strong and have a reduced overall length L.

In addition, mounting, in particular disassembly, for example in the case of a repair, is made easier in that only the closure lid 11 and bearing lid 12 have to be removed from the end of the housing 1 in order to subsequently remove or pull out the main bearings 2.1 and 2.2, respectively, so that the output shaft 3 can then be removed from the through opening 4 with or without the bevel gear 7, depending on the connection.

It is also conceivable, if only the bevel gear 7 is to be replaced, for the bevel gear 7 to be simply pulled off the shaft shoulder 5.1 by opening the closure lid 11 and pulling off the main bearing 2.1.

In addition, it has proven advantageous in the present exemplary embodiment that a single stage or multistage gear mechanism 9 can be quickly and releasably connected to the hypoid stage H of the